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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/541,089 7590	03/31/2000 04/04/2003	Hiroaki Takeuchi	0397-0404P	4024
			EXAMINER	
			PADGETT, MARIANNE L	
		ART UNIT	PAPER NUMBER	
		1762	DATE MAILED: 04/04/2003	

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Please find below and/or attached an Office communication concerning this application or proceeding.

AS-14

<b>Office Action Summary</b>	Application No.	Applicant(s)
	07/541,089	Takeuchi et al
Examiner	Group Art Unit	
M.L. Padgett	1762	

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

Responsive to communication(s) filed on 3/6/03 and 2/6/03

This action is FINAL.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 1 1; 453 O.G. 213.

**Disposition of Claims**

Claim(s) 1 - 1 4 - 10 is/are pending in the application.

Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

Claim(s) \_\_\_\_\_ is/are allowed.

Claim(s) 1 - 1 4 - 10 is/are rejected.

Claim(s) \_\_\_\_\_ is/are objected to.

Claim(s) \_\_\_\_\_ are subject to restriction or election requirement

**Application Papers**

The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.

The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119 (a)-(d)**

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

All  Some\*  None of the:

Certified copies of the priority documents have been received.

Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

Copies of the certified copies of the priority documents have been received  
in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

**Attachment(s)**

<input type="checkbox"/> Information Disclosure Statement(s), PTO-1449, Paper No(s). _____	<input type="checkbox"/> Interview Summary, PTO-413
<input type="checkbox"/> Notice of Reference(s) Cited, PTO-892	<input type="checkbox"/> Notice of Informal Patent Application, PTO-152
<input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review, PTO-948	<input type="checkbox"/> Other. _____

**Office Action Summary**

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1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/6/03 has been entered.

2. Claims 1 and 4-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

While the independent claim now positively generates the plasma, it does not positively process the substrate. Also note that "a holder" (for what?) introduced in the 2<sup>nd</sup> to last line, is never positively related to either the substrate or supporting thereof (line 2), although the location of the generated plasma implies a relationship.

Although not fatal to the clarity of the claim, to improve clarity, the articles before "the plasma processing gas" (line 3), and "the high frequency power" (line 6), are recommended to be changed to --a--, while in line 8 --the-- should be inserted before "high ..." inorder to clarify the antecedent basis for these terms.

New claims 9 and 10, are vague and indefinite, because they do not positively claim actually performing "etching" or "surface treatment", respectively, on the substrate; only that the method "is one for" doing this, hence need never necessarily be preformed.

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3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 4, 5 and 8-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Foster et al, as applied in paper # 10, section 3.

Note a step that is never positively claimed, need not be positively taught, however any effect on a surface, i.e., coating, etching, cleaning, functionalizaion, implanting, etc., is a surface treatment.

5. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foster et al as applied in section 4 of paper # 10.

6. Claims 6-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamazaki et al as applied in section 5 of paper # 10.

Note that while specifically teaching the surface treatment of depositing a carbon coating, Yamazaki et al also discusses etching occurring with their process

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configuration (col. 9, lines 53-68<sup>+</sup>), where gases such as carbon halide may be employed for either coating or etching.

7. Applicant's arguments filed 2/6/03 have been fully considered but they are not persuasive.

Applicants have argued against the above rejections, alleging that the claimed relationship "denotes a linear relationship between the frequency and the pressure", thus realizing certain benefits. However, a line is defined by  $y = ax+b$ , so that the inclusion of "<" less than, requires inclusion of considerably broader values than just a linear relationship. As claimed, anyone who does a plasma process where the employed pressure and frequency satisfy the claimed relationship (plus use opposed electrodes and a reactant gas + inert) read on applicants' claims. It doesn't matter if the claimed empirical formula is recognized or known or not, in order for the relationship to be satisfied. Applicants are in effect trying to retroactively claim all plasma processes that have ever been or are being done which use parameter that satisfy

$$2 \times 10^{-7} \text{ (Torr/Hz)} \times f(\text{Hz}) \leq P \leq 500 \text{ Torr.}$$

As previously noted (advisory action), Foster et al's examples in tables 4, 5 and 6, teach  $P = 5$  torr and  $f = 450$  KHz, therefore giving  $450 \text{ KHz} (10^3 \text{ Hz}/1\text{ KHz}) (2 \times 10^{-7} \text{ Torr/Hz}) = 0.09$  torr, which is  $\leq 5$  torr  $\leq 500$  torr, thus satisfying the claimed empirical formula. One is not required to use a formula to determine parameters to employ, only to satisfy it [after the fact included], which Foster et al does. The formula as claimed is only a means for specifying the range of useful parameters, and any pair of pressure +

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frequency that satisfy the formula read on the claim, if used with claimed gases and apparatus structure.

Similarly, in Yamazaki et al, the examples in col. 17-20 all use 13.56 MHz, which gives  $2.712 \text{ torr} \leq P(\text{torr})$ , so the taught use of 60 or 100 torr in the specific examples meet the claimed criteria, and also explicitly demonstrate that those criteria are not linear (the limit on the edges of the area covered by the formula are linear, i.e., all  $f \leq 2.56 \text{ Hz}$  of the  $P \leq 500 \text{ torr}$ , but not the overall relationship). Given the same criteria for parameters are met, the same relative "high rate" and stable plasma would be produced, hence the same benefits. Note Yamazaki et al also discusses "high-speed film formation" (col. 2, line 63-68 and col. 9, lines 49-51), and the use of rare gas in pressure ranges used and claimed to "stabilize" the discharge (col. 6, lines 19-34), so Yamazaki et al even recognize the benefits of using claimed parameters. To reiterate, an empirical formula, which covers multiple prior art specific examples, cannot be considered to create new and unobvious processes, especially when the relative advantages of those parameters are already known.

8. Any inquiry concerning this communication should be directed to M L. Padgett at telephone number 703-308-2336 and M-F from 8:30 am – 4:30 pm; and FAX # (703) 872-9310 (regular); 872-9311 (after final); and 305-6078 (informal).

M. L. Padgett/mn 3/27/03  
April 3, 2003



MARIANNE PADGETT  
PRIMARY EXAMINER